

Tracking America's physical activity, via smartphone

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Stephen Intille, Associate Professor of Computer and Information Science and Health Sciences

“We know that most Americans are too sedentary,” said Northeastern associate professor Stephen Intille, a founding faculty member of the university’s new Personal Health Informatics graduate program with dual appointments in the College of Computer and Information Science and Bouvé College of Health Sciences. “What we need is high quality information about what drives decisions about physical activity so we can design the next generation of health interventions.”

Toward that end, Intille has teamed up with Genevieve Dunton, an assistant professor of preventive medicine at the University of Southern California, to gather information about where, when, why and how teenagers get their physical activity.

Traditional studies ask participants to place an activity monitor on their hip, which uses an accelerometer to measure motion. “What you get are data recording roughly how active a person is throughout the day, but you don’t get any information other than this motion pattern,” Intille explained. But in order to develop informed interventions, public health professionals also need to know things like where people are when they’re exercising or sedentary, if they’re with other people and what they’re doing.

That’s why Intille and Dunton, with the support of a two-year, \$450,000 grant from the National Institutes of Health, will develop and evaluate a mobile phone app that supplements the activity-monitor data. Using the location and motion technologies already embedded in mobile devices, Intille’s app will determine appropriate times throughout the day to ask study participants about the contexts that are influencing their activity.

“The fundamental idea is there is a relationship between the motion of your phone and the activity that you do and the use of the activity monitor.” The phone will recognize periods of increased or reduced physical activity (for example, if you take it off while playing a high-impact sport or take a nap) and present questions about what a participant is doing during the “interesting” periods.

“It’s about creating and evaluating a tool that would help us augment the type of information that we get from standard research tools so that researchers get that additional contextual info about where and why teens are doing the activity,” said Intille. Dunton explained that the higher quality data will allow researchers to better understand the relationship between physical activity, sedentary behaviors, and the risk of metabolic, cardiovascular and other chronic diseases.

Intille’s lab at Northeastern focuses on sensor-driven mobile health technology. Other studies to come out of it have used a similar approach, but

this is the first time the app will be programmed to recognize major activity changes.

“Previous studies would ask questions randomly throughout the day, but that’s not a very efficient way to do it,” Intille said. This is the first time the app will be programmed to augment an existing research tool by recognizing major activity changes and using a game-like interface that makes it easy for teens to fill in gaps by answering carefully-timed questions.

He hopes that the app will provide a valuable, low-cost tool for future studies that also investigate physical activity patterns.

“In the long term, we could potentially use this same type of technology as an intervention,” said Intille, who explained, for example, that users would receive positive feedback messages through the phone when the app detects that they are being physically active.

Provided by Northeastern University

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